

# **RACQUET STRAND CLIP**

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## ***Background of the Invention***

### ***Cross-References to Related Applications***

5           This application claims the benefit of U.S. Provisional Application No. 60/429,857, filed 11/26/2002.

### ***Field of the Invention***

          This invention relates to fasteners, and more specifically, to clips that affix strands to surfaces using contact pressure.

### ***Description of the Related Art***

          In designing a device for fastening a strand to a surface, such as fastening a length of elastic tubing to a fielding practice bat as disclosed in U.S. Patent Nos. 6,234,922 and 6,386,999, and as sold commercially under the trademark RAC-A-BAT® fielding practice bat, simplicity of design and use, economy, durability, and reliability are desirable characteristics. In the above-mentioned patents, elastic tubing is woven through holes in a frame to form a head surface for hitting a ball. FIGS. 6 and 7A-D in both patents depict methods for connecting the tubing to the frame. The means for attaching the ends of the elastic tubing to the frame, as depicted in FIG. 6, involves threading the elastic tubing through a hole in the frame and then inserting a commercially available screw sheath into the tubing through the hole. A screw is then threaded into the screw sheath, causing the sheath to expand, bending a plurality of ridges along the sheath's external side, and thereby locking the tubing in the hole so that it cannot be pulled out. One disadvantage of this prior means for

attachment is the fact that two separate items are used for the attachment, a screw sheath and a screw, which increases the cost and complexity of use. Another disadvantage is the fact that a tool must be used for installation of the fastener, namely, a screwdriver or comparable device must be used to screw the screw into the sheath. A further disadvantage of using this means for attachment is that the plurality of ridges located along the sheath's external side may cut into the tubing, thus potentially damaging the tubing and thereby decreasing the effective life span of the attachment mechanism.

Alternative means of attaching an end of the tubing to the frame are depicted in FIGS. 7A-D in U.S. Patent Nos. 6,234,922 and 6,386,999. They include the use of a saw tooth fastener, a combination of pin and locking flanges, a "golf tee" pin, and a pin with a locking cap. All of these alternative means are available on the commercial market. Each of these alternative means of attachment have potential disadvantages associated with their use, however. The saw tooth fastener, for example, suffers from one of the same problems associated with the above-mentioned method of attachment: ridges located along the external side of the saw tooth fastener may cut into the tubing thereby compromising the strength and durability of the tubing. The combination of pin and locking flanges involves the use of more than one part for the attachment mechanism, resulting in increased cost and complexity of use. The use of a "golf tee" pin may result in insufficient contact force holding the tubing and "golf tee" pin in place. Thus, a locking cap may be used in conjunction with the pin. This, however, involves the use of more than one part for the attachment mechanism, again resulting in increased cost and complexity of use. All of the above-mentioned existing attachment devices also insert into the hole of the frame of the fielding practice bat. Depending on the length of the inserted portion of the attachment device as well as the depth of the hole, the attachment device may extend into the interior head surface of the fielding practice bat and interfere with its normal use. Indeed, all of the attachment devices depicted in FIGS. 7A-D in U.S. Patent Nos. 6,234,922 and 6,386,999 extend through the hole and into the interior head surface of the fielding practice bat.

Lacking in the existing art is a simple, small, easy to use, inexpensive, single-piece device for attaching a strand, such as elastic tubing, to a surface, such as a frame of a fielding practice bat, such that the device does not interfere in any way with the normal use of the surface. Therefore,

there is a need for a simple, small, easy to use, inexpensive device for quickly and efficiently attaching a strand to a surface. There is a further need for such a device that does not penetrate, or is not inserted through, the surface of the frame, nor is it inserted through the strand itself.

### ***Summary of the Invention***

5           It is an object of the present invention to provide a device for fastening a strand to a surface in a simple, economical, durable, and reliable manner. In accordance with this object, the racquet strand clip of the present invention comprises a block having a slot penetrating through the block. In the preferred embodiment, the block is a small, solid piece of aluminum having a generally rectangular shape. The slot is a thin rectangular space cut lengthwise completely through the block  
10           from top to bottom, along a central axis going from the first end of the block to a point approaching the second end of the block, and wherein the width of the slot is smaller than the width of the strand being secured.

          The racquet strand clip is used as a fastener. Specifically, it is used to affix a long, slender, and flexible strip of material such as a strand, rope, yarn, cord, or tubing to a surface. In the  
15           preferred embodiment, elastic tubing, or surgical tubing, is threaded through the holes of a frame of a fielding practice bat as disclosed in U.S. Patent Nos. 6,234, 922 and 6,386,999, and as sold commercially under the trademark RAC-A-BAT<sup>®</sup> fielding practice bat, wherein the ends of the elastic tubing are protruding from the frame external to the head surface of the bat. A first end of the elastic tubing is pulled taut through a first hole (while holding the second end tight to prevent the  
20           elastic tubing from slipping through the frame) to reduce the thickness of the elastic tubing at its first end. The first end of the elastic tubing then is slid through the slot in a first racquet strand clip, which is placed along and in contact with the outside edge of the frame of the fielding practice bat. The racquet strand clip is a size and shape that fits within the channel of the frame. The first end is then released wherein the elastic tubing returns to its natural state. The inherent elasticity of the  
25           elastic tubing, along with the fact that the slot width is smaller than the strand width, holds the first racquet strand clip in place. The second end of the elastic tubing is similarly pulled taut and slid through a slot in a second racquet strand clip placed along the outside edge of the frame of the

fielding practice bat. The natural elasticity of the elastic tubing keeps the ends of the elastic tubing in place within the slots, and the racquet strand clips in place against the outside edge of the frame of the fielding practice bat.

The present invention represents an innovation in the attachment of strands, e.g., elastic tubing, to surfaces as described because it is small in size, easy to manufacture, inexpensive to manufacture, easy to use, requires no special tools for use, and is a single piece. Because of its small size, light weight, and compact shape, the racquet strand clip does not interfere in any way with the proper use of a fielding practice bat. It also allows easy trimming of excess tubing sticking out of the frame of a fielding practice bat, with minimal chance of damaging the attachment mechanism. Lastly, the racquet strand clip allows for the easy removal and installation of strands on a frame of a fielding practice bat or of stands on any comparable surface through which the strands are threaded.

### ***Brief Description of the Figures***

The present invention is described with reference to the accompanying drawings. In the drawings, like reference numbers indicate identical or functionally similar elements. Additionally, the left-most digit of a reference number identifies the drawing in which the reference number first appears.

FIG. 1 is a perspective view showing the racquet strand clip of the present invention; and

FIG. 2 is a perspective view showing the racquet strand clip of the present invention in use with the frame of a RAC-A-BAT® fielding practice bat.

### ***Detailed Description of the Preferred Embodiments***

As shown in FIG. 1, the racquet strand clip 100 of the present invention is a block 108 that is generally rectangular in shape having a length L, width W, and depth D. The clip 100 is preferably made of a light weight metal, e.g., aluminum, but it can be made of any durable material, including, but not limited to: steel, plastic, rubber, wood, a composite material, etc. The clip 100 also has a slot

102 cut through the block 108 which is positioned along a central axis of the length L of the clip 100. The slot 102 has a closed end 104 and an open end 106. The slot 102 is shown as having squared corners but this is for convenience. The slot 102 also can have rounded corners in order to minimize any possible damage to a strand threaded through the slot 102. The slot 102 also has a width that  
5 is smaller than the width of a strand that is targeted to be secured by the clip 100. In addition, the shown rectangular shape of the block 108 is for convenience. The block 108 of the clip 100 can have any shape that is adaptable to having a slot 102, e.g., square, rectangular, triangular, any polygonal shape, circular, oval, and any curved shape. Also in the preferred embodiment, the block 108 has a shape and size that enables it to fit within a channel of a surface, e.g., a channel in a frame.

10 The preferred dimensions of the clip 100 as used with the RAC-A-BAT<sup>®</sup> fielding practice bat, which is described in U.S. Patent Nos. 6,234,922 and 6,386,999, and is commercially available, are: block 108 length L = about 1/2 inches, block 108 width W = about 3/8 inches, block 108 depth D = about 1/4 inches, slot 102 length = about 3/8 inches, and slot 102 width = about 1/32 inches. All dimensions are used in the preferred embodiment and are for convenience purpose only. It  
15 would be readily apparent to one of ordinary skill in the relevant arts to build a clip 100 of the present invention using different dimensions.

As shown in FIG. 2, the clip 100 of the present invention can be used in conjunction with the frame 202 of a RAC-A-BAT<sup>®</sup> fielding practice bat. In this preferred embodiment, the elastic tubing, strand 206, threaded through the frame 202 of the bat has a wall thickness of 3/32 of an inch and an  
20 outer diameter of 5/16 of an inch. Thus, the preferred slot 102 width, which as described above is about 1/32 of an inch, is smaller than the outer diameter, or width, of the elastic tubing, strand 206. Because the slot 102 width is smaller than the strand 202 width, the inherent elasticity of the strand 206 will hold the strand 206 in the slot 102 of the clip 100.

In operation, a strand 206, which is preferably elastic tubing, is threaded through the holes  
25 204a-c of the head of the frame 202 to create a head surface on which a ball is hit. Specifically, the strand 206 is threaded through the holes 204a-c of the recessed portion 210 of the frame 202, wherein the recessed portion 210 is bounded by a first rim 208a and a second rim 208b. Preferably, a single strand 206 is used to thread the entire head surface of the frame 202, resulting in two ends (only one end 212 is shown on FIG. 2 for convenience) of the strand 206 that must be secured to the

frame 202. The strand 206 is threaded such that its two ends protrude external to the head surface of the frame 202.

To secure an end 212 of the strand 206 to the frame 202, a user inserts the end 212 of the strand 206 through a hole 204b of the recessed portion 210 of the frame 202 in the direction from the inside of the racquet head to the outside. Once the end 212 is through the hole 204b, the user pulls the strand 206 tight (while holding the second end of the strand 206 to prevent the strand 206 from slipping through the frame 202), thereby compressing the strand 206 and making it thinner as it stretches. The user then slides the stretched strand 206 through the slot 102 of the clip 100. Preferably, the strand 206 is slid into the slot 102 until it contacts the closed end 104 of the slot 102. The user releases the strand 206 and, if necessary, trims off the excess strand 206 extending beyond the clip 100, e.g., leaving, for example, about 1/4 inches of the strand 206. The natural elasticity of the strand 206, combined with the narrowness of the width of the slot 102, causes the needed pressure and friction to keep the strand 206 in place and from sliding out of the slot 102, and to keep the clip 100 pressed firmly in place against the surface of the recessed portion 210 of the frame 202.

It is important to note that the clip 100 is of the size and dimension to fit within the recessed portion 210 of the frame 202. The clip 100 also works equally as well with a frame 202 not having rims 208a-b. It is also important to note that the clip 100 may be used in conjunction with other materials for similar applications. For example, the strand 206 may be a cord, rope, string, yarn, rubber string, or any other long, slender, and flexible strip of material. In addition, the width of the slot 102 is determined according to the width and material of the strand 206. As discussed above, in the preferred embodiment, the slot 102 width is 1/32 of an inch for a strand 206 of elastic tubing having an outer diameter of 5/16 of an inch, such that the slot 102 width is ten percent (10%) of the strand 206 width. This ratio is for convenience purpose only and when the strand 206 is elastic tubing. It would be readily apparent to one of ordinary skill in the relevant art to determine the needed slot 102 width for any given thickness and material of a strand 206.

The clip 100 may also be used to hold the strand 206 in place in relation to a surface other than frame 202, such as a different type of frame. Such other surfaces could include any surface containing a hole through which a strand 206 is threaded and affixed. In fact, a strand 206 may be

affixed to any surface by drilling a hole in such surface, threading the strand 206 through such hole, and sliding the end 212 of the strand 206 through the slot 102 of the clip 100, as previously described. The use of the clip 100 in such a manner provides a simple and economical method of attaching a strand 206 to any surface.

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## ***Conclusion***

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While various embodiments of the present invention have been described above, it should be understood that they have been presented by way of example only, and not limitation. It will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined. Thus, the breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments.